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Seasonal Migration and Networks—Evidence on Moldova's Labour Exodus

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Abstract: Seasonal migration is an ever more important phenomenon worldwide, but has received little attention in empirical research. This paper investigates the choice of seasonal versus longer-term migration on a household level. We use data from Moldova, a country that is witnessing a massive emigration shock. Surprisingly, neither children nor marital status appear to influence the decision to leave seasonally or for longer periods. This suggests high social and emotional costs of emigration. We also find that existing local networks of seasonal migrants are unrelated to permanent migration choice. Generally, networks appear to have a stronger influence on migration probabilities in urban settings. JEL no. F22, J61, O15

Keywords: Migration; seasonal migration; migration networks; poverty; Moldova

1 Introduction

Migration is becoming an ever more important factor for the socio-economic situation of sending and receiving countries. In the last decades, a rich empirical literature on the causes and consequences of migration in many developing countries has emerged. However, until today, migration in Eastern Europe has not received a lot of attention in empirical research.¹ Likewise, the phenomenon of seasonal migration has been a relatively neglected issue. This study provides evidence on the determinants of Moldovan migration in general, and on the choice of seasonal versus

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¹ Exceptions include Kule et al. (1999), Léon-Ledesma and Piracha (2004), or Locher (2002).

permanent migration in particular. In both regards, considerable attention will be placed on the role of migration networks.

With an exceptionally high number of international migrants, the Republic of Moldova constitutes an interesting case study.² The first significant wave of workers left the country after the regional economic crisis in 1998. Today, people are departing at an unprecedented scale. The number of Moldovans working abroad is estimated to have reached 600,000 workers by the end of 2004, which is impressive if one considers that the country's economically active population consists of only about 1.6 million people (Cuc et al. 2005; Pyshkina 2002). In parallel to this strong emigration shock, the country has become highly dependent on remittances.³

To date, no quantitative research exists on the driving forces of migration in Moldova and our study is a first attempt to fill this gap. Besides that, the main distinguishing feature of this article is its strong focus on the seasonality of migration. As in many countries in the developing world, seasonal migration has become an increasingly important trend in Moldova. Similar to thousands of Mexicans crossing the border to work in the United States for a short period, and in parallel to large numbers of Poles working in Germany during harvest times, many Moldovans work in Russia as seasonal service migrants, mainly in the construction sector.

We define seasonal migration as a situation in which the migrant has left the country "seasonally, for a few months".⁴ In contrast to permanent migration, seasonal migration usually does not involve a change in residence so that the migrant can mitigate the risks of moving to a new environment. Accordingly, short-term migration can be an important strategy to cope

² A recent report by the IMF underlines that Moldova's social and economic structure makes it a typical place for mass emigration (Cuc et al. 2005). Having been relatively prosperous, the landlocked and densely populated country witnessed a sharp economic decline after independence in 1991. Accordingly, poverty rates have risen considerably, especially in small town communities and in rural areas (IMF 2004; Pyshkina 2002). The economy—mainly based on agriculture and related products—has lagged far behind other Central and Eastern European countries (Hensel and Gudim 2004). A main reason for the severity of Moldova's economic downturn has been the early secession of the Transnistrian region, where most of the country's industrial and electricity-generating capacity was situated in Soviet times.

³ According to World Bank staff estimates, Moldova is ranked second worldwide among the countries with the highest share of international remittances, as percentage of GDP (World Bank 2005). Taking into account both formal and informal transfers, remittances were estimated to amount to 27,1 per cent of GDP in 2004.

⁴ The question if the migrant had intended to leave "seasonally, for a few months" was explicitly asked in the questionnaire and stood in contrast to longer-term/permanent migration intentions.

with poverty for those who are not able or willing to depart permanently or for large distances (Konseiga 2007). Moreover, by frequent returns home, the psychological and social costs of separation can be considerably reduced.

Seasonal and permanent migration are likely to have very different consequences for migrant-sending and migrant-receiving countries. The labour market effects in the source country are certainly less severe if large proportions of the migrants are “only” seasonal. Also, seasonal migrants are usually not accompanied or followed by their family members, which can make a huge difference for receiving countries. Additionally, seasonal migrants tend to work illegally abroad, many under dismal conditions. In fact, due to their short stay in the host country and given their mostly irregular status many seasonal migrants are forced to accept harsh working conditions (Okólski 2004). Taken together, it could be of much interest to policymakers to understand which households typically choose for seasonal migration and which ones engage in longer-term or even permanent migration.

According to the data at hand, more than 40 per cent of Moldova’s international migrants are seasonal. Given this high proportion, the case of Moldova appears particularly interesting to investigate the phenomenon of short-term international labour movements. Concisely, we address the following research questions:

- (1) What are the general determinants of migration in Moldova?
- (2) What are the determinants of seasonal migration in particular?

We separately estimate simple logit models for (1) the general migration decision, and (2) the decision to migrate seasonally (versus permanently). As robustness check, we link the two regressions in bivariate probit models, which allow for sample selection.

Focussing on the general determinants of migration first, we find that the probability of sending a migrant increases in household size, education, and the presence of a household member with Romanian or Bulgarian passport. We also find that the existence of community networks and previous migration experience are important determinants of migration in Moldova—particularly in urban settings. Generally, migration appears to be an important coping strategy of Moldova’s poor. We establish that households who consider themselves as poor have a higher propensity to send a migrant than richer households.

Turning to the determinants of seasonal migration, we can report some interesting, and sometimes surprising new insights. First, we find that the

probability of seasonal migration increases significantly if the migrant is male, while marital status has no effect on the decision of migration duration. Similarly, the household's perceived poverty does not seem to affect the choice for seasonal versus permanent migration. Even the presence of dependents (younger than 16) and young dependents (younger than 6) does not appear to influence the decision whether to migrate for longer or shorter periods of time.

The paper is organized as follows: Section 2 provides a short overview on the related literature. Section 3 describes the data set and variables used for the econometric estimations. In Section 4, we discuss our methodology, and in Section 5 we will present and discuss our results. Section 6 concludes.

2 Review of Related Studies

This article builds on a well-established literature on the determinants and consequences of migration on a micro level (see e.g. de Haan (1999) and Rapoport and Docquier (2006) for an overview). Both the empirical approach and the explanatory variables used are in accordance with much of this existing literature.⁵ Generally, a large number of migration studies, including most of those cited here, are based on the Mexican case, which, notably, has a series of common features with the Moldovan migration experience. Both countries are subject to massive out-migration, with seasonal migration being a widespread phenomenon. Also, large shares of migrants in both countries come from rural areas, and the prevalence of illegal migration is high.⁶

Starting with the specifics of seasonal migration, there are very few published studies we can refer to. Among them are Basok (2003) who studies the developmental impact of seasonal migration from Mexico to Canada and Konseiga (2007) who uses a small sample of 250 households

⁵ For example, we assume that migration is mainly a decision made at the household level. The departure of a migrant is seen as familial strategy to ease liquidity constraints and diversify risks in the absence of well-functioning labour, insurance and credit markets (Stark 1991; Taylor and Martin 2001).

⁶ While Moldova's labour migrants in the early 1990s were mainly from the urban population, the proportion of migrants from rural areas has strongly increased. Today, the share of migrants in the rural and urban population is claimed to be about the same, although the total number of migrants from rural areas is larger (Ghencea and Gudumac 2004).

to study seasonal migration from Burkina Faso to Cote d'Ivoire.⁷ However, to date, no study has compared the determinants of seasonal and longer-term migration in a representative sample. This apparent literature gap can probably be best explained by data constraints. In fact, only very few specialized surveys allow for a systematic analysis of seasonal or circular migration (Lucas 2003). The data set used in this study is such a specialized survey, in that we can identify whether a household has seasonal or longer-term migrants.

Contrary to seasonal migration, the role of networks for migration decisions has received far more attention. It is now widely acknowledged that networks can be a crucial determinant of migration. Many important migration studies such as Massey et al. (1994) or Munshi (2003) all find strong evidence for network or "family and friends" effects in migration flows. Networks imply that information on, e.g. destination or travel modes is made available to a potential migrant. This enables him or her to better assess the costs and benefits of working abroad, so that hazards of migration are mitigated. Moreover, the migrant might receive direct assistance before departure or in the destination country.

Recent years have brought about a remarkable body of studies with more detailed evidence on networks. As an example, Bauer et al. (2007) differentiate between network effects, as measured by the stock of migrants, and herd effects, as measured by the flow of migrants. An interesting finding is that herd effects turn out to be about twice as large for migrants doing their first trip than for repeat migrants.⁸ In a similarly extensive article, Davis et al. (2002) find that stronger ties, i.e. to close relatives, are much more relevant in assisting migration than weaker ties, e.g. to neighbours in the same community. Their results also indicate that networks are more important for international migration movements than for internal migration, which they attribute to a higher degree of uncertainty when departing abroad. This finding strengthens the expectation that networks are highly significant for Moldova, where most migration movements take place cross-border. A noteworthy article by McKenzie and Rapoport (2007a) links the effect of networks and wealth in migration strategies. The authors argue that, in absence of networks, mostly wealthier households send a migrant, since they have more means to overcome informational constraints and risk

⁷ There are also a series of studies on temporary migration such as those by Dustmann (1997, 1999).

⁸ The finding of networks being more important for "first trips" corresponds to other studies, including Orrenius and Zavodny (2005) and Bauer et al. (2000).

a smaller proportion of their livelihood. Only in a second stage, when these early movers start to establish sizeable networks, migrants from poorer households follow and are able to emigrate as well.

Here, in accordance with, e.g. Winters et al. (2001), we include both family and community network variables in our estimations.⁹ Additionally, we construct a measure of seasonal migration networks to investigate the effects at work in more detail. With a view to McKenzie and Rapoport (2007a) and a series of other studies showing poverty or wealth to play an important role for migration, we also include a poverty variable.¹⁰ Concretely, we capture poverty by including an indicator which is not based on money values. Instead we measure poverty according to the subjective views of households, which is done similarly by, amongst others, Van Dalen et al. (2005).

Lastly, some comments on the relationship between education and migration, which has received a lot of attention in the related literature. Mora and Taylor (2005), Taylor et al. (2003), or Adams (2005) all find that years of schooling and other human capital variables have a significant positive impact on the decision to migrate. However, the issue of whether migrants positively or negatively select is controversial. For example, Chiquiar and Hanson (2005) and Orrenious and Zavodny (2005) find general evidence for intermediate selection in Mexican migration to the United States. Chiquiar and Hanson (2005) also conclude, that migrants tend to positively self-select when the costs of migrating are high, and vice versa. McKenzie and Rapoport (2007b) investigate this relationship more closely, again focusing on networks. They underline Chiquiar and Hanson's (2005) findings in that the effect of education on migration probability appears to depend on network size, which tends to decrease migration costs.

3 Data

The analysis done in this paper is based on a data set with an explicit focus on migration and remittances in the Republic of Moldova. The survey

⁹ Interestingly, Winters et al. (2001) find that the community and family networks are substitutes for migration decisions. According to their results, strong community networks also appear to erase the importance of household characteristics for migration choices.

¹⁰ In their specific review on the issue, Waddington and Sabates-Wheeler (2003) conclude that there is reason to assume a non-linear, potentially concave relationship between income or wealth and migration. While, generally, the poor have higher migration propensities, a certain level of well-being is necessary to afford the costs of migrating.

was conducted by CBS AXA, in co-operation with the EU Food Security Programme and the IMF in Moldova.¹¹ It was done during the months October and November 2004, and included migration cases after January 2003. The sample consists of 3,668 randomly selected households, of which 1,000 households reported to have a migrant. All households participated in a screening study in order to find out about general household characteristics, such as household size, education, or expenditures. Additionally, the 1,000 households with migrants were interviewed more in depth in order to obtain details about the migrant, the situation before and after migration, and remittances received.¹² Here, we employ the screening study for answering questions about the migration decision and well-being of migrant households. Then, we use the smaller sample of migrant households to further investigate the determinants of seasonal migration.

3.1 Description of Variables

In order to analyse the determinants of migration (question 1), we employ a binary variable indicating whether a household has a migrant or not. If the household is a *migrant household*, it takes on the value 1 and is zero otherwise. Further, we analyse the determinants of migrating seasonally (question 2). The second dependent variable *seasonal migrant* takes on the value 1 if the migrant was abroad for a few months only, and is zero otherwise.

Table 1 shows the summary statistics of our variables for the entire sample, non-migrant households, and migrant households, sorted by the variable categories household characteristics, poverty perception variables, network variables and community variables.

Turning to the variables on household characteristics first, we capture the number of all household members by the variable *household size*. We expect the probability of migration to be higher in large households since they may be more prone to diversify their allocation of labour internationally and it will be less costly for them to send one productive member abroad. We also define a variable for the number of *dependents* (all household members of age 15 or younger), and *young dependents* (household members younger

¹¹ Note that the survey excludes the breakaway region of Transnistria (east of the Dniestr river), which is de facto independent and not controlled by the Moldovan government.

¹² Further details about the survey and a summary report are provided in CBS AXA (2005).

Table 1: *Summary Statistics*

	A. Overall		B. Non-migrant households		C. Migrant households	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Migrant household (0/1)	0.27	0.45	—	—	—	—
Seasonal migrant (0/1)	—	—	—	—	0.40	0.49
Household size	3.34	1.45	3.07	1.41	4.08	1.30
Dependents	0.57	0.83	0.51	0.80	0.72	0.90
Young dependents	0.14	0.40	0.11	0.36	0.20	0.47
Adults with secondary education	1.00	1.18	0.91	1.11	1.26	1.32
Adults with vocational education	0.60	0.87	0.52	0.80	0.81	1.00
Adults with university education	0.56	0.89	0.54	0.85	0.62	0.99
Age of household head	52.96	14.98	54.00	15.36	50.19	13.54
“European” citizenship	0.03	0.18	0.02	0.15	0.06	0.25
Perceived poverty sit.: bad	0.46	0.50	0.46	0.50	0.47	0.50
Perceived poverty sit.: medium	0.39	0.49	0.35	0.48	0.51	0.50
Perceived poverty sit.: good	0.14	0.35	0.19	0.39	0.02	0.16
Family migration experience	0.18	0.39	0.08	0.27	0.47	0.50
Community networks	27.37	15.98	23.86	13.83	36.72	17.51
Community networks, seasonal migr.	10.97	8.49	10.03	7.76	13.46	9.74
Rural household	0.54	0.50	0.50	0.50	0.65	0.48
Household in Chisinau	0.20	0.40	0.24	0.43	0.09	0.28
Migrant is male	—	—	—	—	0.66	0.47
Migrant’s age	—	—	—	—	34.75	9.77
Migrant is married	—	—	—	—	0.62	0.49
Migrant’s education	—	—	—	—	2.58	0.93
No. of observations	3,668		2,667		1,000	

than 6).¹³ The effect of children on migration choices is ambiguous. On the one hand, household members who are responsible for many children might be less likely to leave due to the high cost of separation. On the other hand, the presence of many dependents might raise the motivation to work abroad in order to cover costs for their needs (McKenzie 2005).

We account for human capital by including variables indicating the number of household members with *no completed education*, with completed *secondary education*, with completed *vocational education*, and with completed *university education*. Moreover, a variable for *age of household head* is introduced. This variable is expected to be positively related to the prevalence of migration, as older household heads are more likely to have children in the prime migration age (Adams 2005).

¹³ Note that, in order to avoid possible problems of multi-collinearity, we never include the variables *dependents* and *young dependents* simultaneously.

Moreover, we introduce a dummy indicating whether a household member (usually the migrant) has a Romanian or Bulgarian passport. We do this since an undisclosed number of Moldovans hold a second, Romanian or Bulgarian passport.¹⁴ The possession of such foreign citizenship considerably lowers the cost and risks of international migration, especially towards the West. Kule et al. (1999) show for Albania that ease of access to migration destinations, for example the availability of a visa, motivates emigration. Accordingly, holding a “*European*” citizenship is expected to increase the probability of migration, at least to Western destinations.

The next set of variables contains *poverty perception* indicators. Our survey allows assessing present day poverty perception because households were asked about their ability to purchase basic necessities. However, for migrant households, the perceived poverty *today* might not be representing perceived poverty at the time when the migration decision was made. In fact, it is very likely that the household’s situation improved due to remittances received from the migrant. In order to obtain information about the household’s socioeconomic situation *before* migration, we construct a poverty perception variable based on the household’s assessment of food and clothes availability, and living conditions before migration.¹⁵ This is subsequently pooled with present day perceptions of *non*-migrant households. Our approach—based on qualitative perceptions about the adequacy of food, clothing, and housing consumption—is in line with Pradhan and Ravallion (2000) who show that such indicators can be used to derive subjective poverty lines.

Generally, the use of subjective poverty measures and the partly retrospective nature of the assessment requires a word of warning about possible biases involved. Subjective assessment of poverty might for example be driven by cognitive problems related to survey design (i.e. ordering of questions, wording, scales). Moreover, there could be a response bias because people might be embarrassed to report their true poverty situation, or because they want to report a socially desirable result. Finally, cognitive dissonance might occur, which means that people report a poverty situation that is consistent with their past behaviour (Bertrand and Mullainathan 2001). Additionally, the retrospective assessment of poverty could

¹⁴ Approximately 80,000 Moldovans could acquire Romanian citizenship as a result of Romania’s “naturalisations policy” of the very early 1990s. In recent years Romania tightened its requirements so that only about 3,000 Moldovans have been able to receive a Romanian passport in the course of the last decade (*The Economist*, January 30, 2007).

¹⁵ We consider these three items as bare necessities.

be subject to recall bias, since people may have difficulties to remember the past situation (Orrenius and Zavodny 2005). Note finally, that people assess personal well-being and living conditions from a comparative viewpoint, i.e. conditions in the neighbourhood or the well-being of friends influence their assessment (Kahneman and Krueger 2006). In a country with many migrants, this could also mean that migrant families assess their living condition compared to those in the migrant's host country. Nevertheless, we believe that the use of our qualitative indicator, which resembles those of other related studies, provides a useful proxy for poverty.

As stated, we also construct several network variables. The most commonly used measure to quantify networks is the migration prevalence ratio, which is simply the percentage of households in a certain community that ever had a migrant (McKenzie 2005). We calculate the percentage of migrant families in each of Moldova's 137 localities for the year 2004 (*community network*). We also construct a network variable that measures the prevalence of only seasonal migration because we suspect it to influence the decision to migrate seasonally differently than overall migration prevalence. In addition to these community networks, we introduce a dummy for an existing *family migration experience*, which captures whether the family ever had a migrant abroad.

Lastly, we include location variables to control for locality effects, i.e. dummies indicating whether a household is *rural* or urban, and whether it is situated in the capital *Chisinau*. For the subsample of migrant households, we also employ individual migrant characteristics, including gender (a dummy denoted as *male migrant*), marital status (a dummy denoted as *married*) and the individual *educational level* (dummies for every educational level).¹⁶

3.2 Some Stylised Facts on Migrant Households in Moldova

Two main surveys on the patterns of international migration have been conducted only recently, providing detailed insights on the characteristics, destinations and remittance behaviour of Moldovan migrants (Ghencea and Gudumac 2004; CBS AXA 2005). The two studies draw a clear picture about the profile of migrants. The large majority of migrants are men, married and young, i.e. in the age group between 21 and 40. As in the rest of Moldova's working population, most migrants have secondary edu-

¹⁶ These variables will only be used for analysing the determinants of seasonal migration.

cation and 20–25 per cent of them completed university. On average, male migrants are younger and carry out physical work in the construction and mechanical service sector, while female migrants, who tend to be older, engage mostly in housekeeping, health care, and social assistance.

As to the data set at hand, 27 per cent of all households in our sample have a migrant (see Table 1). As mentioned above, a share of 40 per cent of these migrants are seasonal migrants, defined as having left “seasonally for a few months”. Concerning migration destinations, the overwhelming proportion of migrants work in Russia (60 per cent) followed by some EU countries, particularly those with a spoken language similar to Moldavian (and Romanian), i.e. Italy (19 per cent) and Portugal (6 per cent). Looking at the seasonal migrants only, almost 50 per cent go to Russia, next is Italy with 23 per cent, and the rest is scattered across many countries.

Comparing migrant and non-migrant households in our data set conveys some interesting insights as well. First, migrant households have on average one member more than non-migrant households, slightly higher education, younger household heads, and more often a household member holds a “European” citizenship. Second, it appears that networks are a major distinguishing feature of migrant and non-migrant households. Almost half of the migrant households have migration experience, whereas this is reported by only 8 per cent of the non-migrant households. Moreover, community networks are also larger for migrant households, i.e. they seem to live in communities where migration is more common. Third, 65 per cent of the migrant households live in rural areas, compared to 54 per cent of all households. In the capital city Chisinau the proportion of migrant households is particularly low with a prevalence ratio of just 9 per cent compared to the average of 27 per cent.

4 Methodology

We estimate the migration decision in simple logit models using maximum likelihood. The logit models are of the usual form,

$$P(y = 1 | X) = G(X\beta), \quad (1)$$

where y is either (1) the general migration decision or (2) the decision to migrate seasonally (versus longer term), and X is a vector of household and community variables and in the case of seasonal migration also individual migrant characteristics.

The models for the general migration decision are estimated for the entire sample of households, whereas the models for the seasonal versus longer-term decision are estimated for the sample of migrant households only, because this decision is not observed in non-migrant households. Note that such incidental truncation raises the issue of a possible sample selection bias in the regressions of seasonal versus longer-term migration.

Selection bias occurs if the error term of the outcome equation in the selected sample, i.e. the seasonal versus longer-term choice, is correlated with the error term of the selection equation, i.e. the general migration decision (Wooldridge 2002). Since the same person or household who makes the decision to migrate also makes the decision whether to migrate seasonally or permanently, it is possible that the error terms in the two equations are indeed correlated. This would render our approach of separate logit models invalid, even for our comparative purposes.

Due to these econometric concerns and as a robustness check, we also estimate a bivariate probit model, which allows for sample selection. The classic Heckman selection model (Heckman 1979) can only deal with a continuous outcome variable. Therefore we use a variation of the model, adapted for a binary outcome variable (see Van De Ven and Van Praag (1981) for details). The results and exclusion restrictions are presented as robustness checks in Section 5.3, and will show that sample selection does not bias our results. This means, that we can rely on logit models when comparing seasonal and permanent migrants.

5 Empirical Results

This section presents our estimation results. We first address the general decision of whether to send a migrant or not, which is analysed for the entire sample at disposal. Then, we turn to the question of what determines seasonal migration, as compared to longer-term migration. This part of the analysis is constrained to the subsample of 1,000 migrant households.

5.1 General Migration Decision

The regression results for the general decision of sending a migrant are presented in Table 2; the marginal effects of the logit regressions are reported in Table 3. We present four different specifications of the model. The coefficient of household size turns out to be significantly positive. Hence, an

Table 2: *Regression Results for the Decision to Send a Migrant*

	Spec. 1	Spec. 2	Spec. 3	Spec. 4
Household size	0.56*** (0.06)	0.56*** (0.06)	0.55*** (0.06)	0.54*** (0.06)
Dependents	-0.41*** (0.08)	-0.42*** (0.08)	-0.41*** (0.08)	-0.40*** (0.08)
Adults with secondary education	0.08 (0.06)	0.05 (0.05)	0.08 (0.06)	0.06 (0.05)
Adults with vocational education	0.12* (0.07)	0.14** (0.06)	0.13** (0.07)	0.15** (0.06)
Adults with university education	0.16** (0.07)	0.12* (0.06)	0.17** (0.07)	0.18*** (0.06)
Age of household head	-0.02*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)
“European” citizenship	1.02*** (0.24)	1.22*** (0.23)	1.03*** (0.24)	1.22*** (0.23)
Perceived poverty sit.: bad	3.09*** (0.25)	2.78*** (0.24)	3.10*** (0.26)	2.79*** (0.24)
Perceived poverty sit.: medium	3.08*** (0.25)	2.84*** (0.24)	3.10*** (0.25)	2.87*** (0.24)
Family migration experience	2.19*** (0.12)	2.25*** (0.11)	2.18*** (0.12)	2.20*** (0.11)
Rural	-0.31*** (0.11)	0.24** (0.10)	0.02 (0.22)	—
Community network	0.05*** (0.00)	—	0.06*** (0.01)	—
Rural × community network	—	—	-0.01* (0.01)	—
Chisinau	—	—	—	-0.94*** (0.14)
Constant	-6.73*** (0.36)	-5.21*** (0.32)	-6.92*** (0.37)	-4.91*** (0.32)
Observations	3,666	3,666	3,666	3,666
Pseudo R2	0.3504	0.2882	0.3511	0.2982

*, **, *** indicate significance at the 10, 5 and 1 per cent level respectively. Standard errors in parentheses.

additional household member increases the probability of having a migrant in the household by approximately 8 per cent. However, an additional dependent decreases the probability of having a migrant by more than 6 per cent. Replacing *dependents* by *young dependents*, i.e. those younger than 6, reveals that young dependents alone do not have a significant effect on the migration decision (result not reported).

Table 3: *Marginal Effects on the Probability to Send a Migrant Abroad (per cent)*

	Spec. 1	Spec. 2	Spec. 3	Spec. 4
Household size	8.19***	8.82***	8.09***	8.29***
Dependents	−6.04***	−6.52***	−5.92***	−6.16***
Adults with secondary education	1.22	0.72	1.24	0.98
Adults with vocational education	1.82*	1.84*	1.91**	2.30**
Adults with university education	2.35**	2.14**	2.46**	2.71***
Age of household head	−0.27***	0.30***	−0.27***	−0.30***
“European” citizenship	19.51***	25.13***	19.67***	24.88***
Perceived poverty sit.: bad	48.35***	45.62***	48.41***	45.21***
Perceived poverty sit.: medium	52.39***	50.32***	52.63***	50.31***
Family migration experience	43.74***	46.43***	43.53***	45.05***
Rural	−4.59***	3.82**	0.25	—
Community network	0.74***	—	0.84***	—
Rural × community network	—	—	−0.17*	—
Chisinau	—	—	—	−12.17***

*, **, *** indicate significance at the 10, 5 and 1 per cent level respectively. Marginal effects are evaluated at the mean.

Age of the household head lowers the probability of being a migrant household significantly. This stands in contrast to Adams (2005) who finds the opposite. However, although the effect is statistically significant, it does not have any quantitative effect, as the marginal effect of −0.27 per cent in Table 3 shows. Note in this regard, that we also included age squared of the household head. However, it resulted to be insignificant and did not change the results so that we drop age squared in the regressions.

As expected, holding a “*European*” citizenship (i.e. Romanian or Bulgarian) strongly increases the probability of sending a migrant abroad (by more than 19 per cent). The citizenship eases access to the EU countries and therefore has a positive impact on migration probability.¹⁷

Next, it is interesting to discuss the coefficients of the *education* variables. As all four specifications show, only the number of adults with university education is significant at the 5 per cent level. The number of adults with vocational education has a weaker effect; the effect of members with sec-

¹⁷ One might argue that European citizenship is endogenous, as people with migration plans might seek to obtain a Romanian or Bulgarian passport before departing. However, the problem of endogeneity should not be of particularly concern here, since it is known that only very few Moldovans were able to acquire a foreign passport in the last decade (see above).

ondary education is even insignificant. Although an additional adult with higher education increases the migration probability, we have to qualify this statement since the quantitative importance of this variable is not very high (a maximum of 2.7 per cent increase in probability). Hence, education does not appear to play a main role in determining Moldovan migration flows.¹⁸

The household's *perception of poverty*, which functions as an indicator for the household's wealth, turns out to be an extremely significant determinant of sending a migrant, both statistically and quantitatively. As the four specifications indicate, the perception of being poor strongly increases the probability of sending a migrant (up to 52 per cent) if compared to households who perceive themselves as *not* poor (which is the base level). To put it differently, those households who do not have enough revenue for the bare necessities, or those who just have enough, are much more likely to send a migrant. These results indicate that migration in Moldova has become a coping strategy for poor households, which is in line with Moldova's poverty reduction report (IMF 2004) and the IMF report by Cuc et al. (2005). Moreover, additional statistics in CBS AXA (2005) reveal that a large part of migrant households use the foreign wage income and remittances for the most basic consumption necessities such as food or clothes.

Turning to network effects, we find that *family migration experience*—i.e. whether the household ever had a migrant—strongly increases the probability of having a migrant today in all four specifications: the probability is increased by up to 46 per cent, compared to households that never had a migrant. Besides that, *community networks* also have positive and significant effect on migration probability. Although the marginal effect shown in Table 3 appears small (0.74–0.84 per cent), this is in fact a rather significant increase: since we measure the size of the community network in per cent of migrant households in a community, the effect implies that a 1 per cent increase in network size, increases a household's migration probability by three quarters of a per cent. Thus, in line with the above-cited literature on other developing countries, we find clear evidence for strong network effects also in Moldova.

¹⁸ The fact that university education does play a small role may seem surprising, since most migrants work as "low skilled" employees abroad (e.g. as seasonal workers on construction sites in Russia). Yet, as we will see in the next subsection, the coefficients have the opposite sign if one considers only the decision to migrate seasonally.

If one links this last result to the above-mentioned conclusion that migration is particularly likely among poor households, and with a view to the article by McKenzie and Rapoport (2007a) discussed above, Moldova appears to have reached an advanced stage of migration. Today's migrants can benefit from sizeable networks abroad and a flourishing "migrational infrastructure", which permits even the most poor to search work abroad—at least in destinations such as Russia, which can be accessed relatively cheaply.¹⁹

Interestingly, our findings for the importance of location variables (i.e. rural, Chisinau) are strongly connected to the effects of networks. In specification 1, the coefficient for *rural* is significantly negative, implying that households from rural areas are less likely to have a migrant. This result is somewhat counterintuitive as we would expect the incentive to migrate—at least to Russia—to be especially high in rural settings, where chances for employment are low and the poverty situation is harsh (note that we control for the latter). The explanation for the counterintuitive result lies in the inclusion of the community network variable. When it is dropped (specification 2), the coefficient of the rural dummy becomes significantly positive. In other words, either community networks seem to take over the role of living in a rural setting in determining migration, or the reverse happens.

We investigate this finding more closely by including an interaction term of *rural* and *community network* in specification 3. The coefficient of the interaction term is significantly negative and indicates that a 1 per cent increase in the migration prevalence ratio (community network) has a weaker effect on migration probability in rural areas than in urban areas.²⁰ According to this result, living in a rural community dampens the effect of networks. Apparently, a rural environment can partly function as a substitute for a migrant network. One might speculate, that in smaller communities, and in the countryside, the migration prevalence ratio (network) does not have to be large in order to know somebody with migration experience. This stands in contrast to life in larger, more anonymous cities, where it might be more difficult to meet the right person to help you.

¹⁹ While the costs of migrating to Russia or other countries in the region amount to a mere US\$ 100, costs for a visa and/or illegal transfer to an EU country such as Spain can well surpass US\$ 2,000.

²⁰ Using marginal effects from Table 3, we find the following partial effects of rural communities and networks on migration probability:
 $\partial P(\text{migrant household} = 1) / \partial \text{network} = 0.84 - 0.17 \text{ rural}.$

Finally, note that a dummy indicating whether a household lives in the capital Chisinau can replace the dummy for a rural household. The result shows that the fact that a household is based in Chisinau lowers the probability of sending a migrant by more than 12 per cent, if compared to households based outside Chisinau. This finding is in accordance with the above-mentioned reports on migration in Moldova.

5.2 Seasonal versus Longer-Term Migration

To find out more about the determinants of seasonal migration we again employ logit models on a binary variable indicating whether a household has a seasonal migrant. Note that the issue under consideration now is not the decision to migrate but the decision whether to migrate seasonally or permanently, so that the regression is now run for the 1,000 migrant households only.²¹ In contrast to the former analysis, we can therefore make use of some individual migrant characteristics as well. Regression results for specifications 1–5 are presented in Table 4. The estimated marginal effects on the probability of seasonal migration (at mean values) are shown in Table 5.

All five specifications show that *household size* has a weak, but positive effect on the probability of seasonal migration, although only in specification 5 it is clearly significant. Moreover, *age of household head* has a significant negative effect on the seasonal migration decision. However, as before, the variable is quantitatively hardly important (at most -0.43 per cent per additional year), as can be seen from the calculated marginal effects.

While the presence of *dependents* or *young dependents* appears to lower the general migration probability (see above), we do *not* find any significant effect on the decision of how to migrate, i.e. seasonally or permanently. We think that this result is extremely surprising as we expected the opposite—especially in case of young dependents (children younger than 6). After all, it seems to make sense intuitively that parents who decide to migrate would rather engage in seasonal migration to be able to return home regularly.²²

²¹ Note that, due to incomplete data, only 999 or 998 observations are used in the regressions.

²² One could also argue that a parent's decision to migrate permanently can be partly explained by altruism. Parents might choose to emigrate permanently (e.g. to distant destinations in the EU) in order to earn more money, more regularly to sustain their family. Nevertheless, there is reason to assume that the increasing number of children staying behind is becoming a serious social problem in countries of mass emigration such as

Table 4: *Regression Results for the Seasonal (versus Longer-Term) Migration Decision*

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Household size	0.13 (0.08)	0.14 (0.08)	0.13 (0.08)	0.11 (0.08)	0.16 (0.08)**
Dependents	0.00 (0.11)	-0.00 (0.11)	-	-	-
Young dependents	-	-	-0.03 (0.24)	0.07 (0.25)	0.05 (0.25)
Adults with secondary education	-0.05 (0.07)	-0.05 (0.07)	-0.06 (0.09)	-0.09 (0.09)	-0.14 (0.09)
Adults with vocational education	-0.16 (0.09)*	-0.15 (0.09)*	-0.13 (0.10)	-0.16 (0.09)*	-0.19 (0.08)**
Adults with university education	-0.33 (0.10)***	-0.31 (0.10)***	-0.24 (0.12)**	-0.22 (0.12)*	-0.24 (0.13)*
Age of household head	-0.02 (0.01)***	-0.02 (0.01)***	-0.01 (0.01)**	-0.01 (0.01)*	-0.01 (0.01)**
“European” citizenship	0.12 (0.27)	0.10 (0.26)	-	-	-
Perceived poverty sit.: bad	-0.29 (0.45)	-	-	-	-
Perceived poverty sit.: medium	-0.01 (0.45)	-	-	-	-
Family migration experience	0.82 (0.14)***	0.83 (0.14)***	0.82 (0.23)***	0.71 (0.22)***	0.64 (0.23)***
Community networks	0.01 (0.01)	0.01 (0.01)	0.00 (0.02)	-	-0.06 (0.01)***
Community networks, seasonal migr.	-	-	-	0.08 (0.02)***	0.12 (0.01)***
Rural household	0.23 (0.15)	0.23 (0.15)	-	-	-
Household in Chisinau	-	-	-0.56 (0.41)	0.22 (0.19)	-0.62 (0.19)***
Migrant is male	-	-	0.90 (0.14)***	0.94 (0.16)***	0.96 (0.16)***
Migrant’s age	-	-	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.01)
Migrant is married	-	-	0.11 (0.16)	0.05 (0.14)	0.06 (0.16)
Migrant’s education	-	-	-0.13 (0.11)	-0.13 (0.11)	-0.12 (0.12)
Constant	-0.39 (0.57)	-0.55 (0.39)	-0.46 (0.88)	-1.47 (0.56)***	-0.11 (0.66)
Observations	999	999	998	998	998
Pseudo-R2	0.07	0.07	0.10	0.17	0.19

*, **, *** indicate significance at the 10, 5 and 1 per cent level respectively. Robust standard errors in parentheses.

Table 5: *Marginal Effects of Probability of Seasonal versus Longer-Term Migration (per cent)*

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Household size	3.14	3.23	2.99	2.70	3.83**
Dependents	0.07	−0.02	—	—	—
Young dependents	—	—	−0.62	1.68	1.19
Adults with secondary education	−1.24	−1.09	−1.44	−2.16	−3.16
Adults with vocational education	−3.83*	−3.58*	−3.14	−3.86*	−4.40**
Adults with university education	−7.93***	−7.48***	−5.72**	−5.17*	−5.62*
Age of household head	−0.40***	−0.43***	−0.29**	−0.25*	−0.31**
“European” citizenship	2.91	2.34	—	—	—
Perceived poverty sit.: bad	−6.92	—	—	—	—
Perceived poverty sit.: medium	−0.32	—	—	—	—
Family migration experience	19.44***	19.61***	19.34***	16.77***	14.85***
Community networks	0.19	0.22	0.11	—	−1.47***
Community networks, seasonal migr.	—	—	—	1.81***	2.72***
Rural household	5.36	5.44	—	—	—
Household in Chisinau	—	—	−12.32	5.41	−13.35***
Migrant is male	—	—	20.19***	21.14***	21.13***
Migrant’s age	—	—	−0.27	−0.18	−0.06
Migrant is married	—	—	2.67	1.07	1.33
Migrant’s education	—	—	−2.98	−3.06	−2.91

*, **, *** indicate significance at the 10, 5 and 1 per cent level respectively. Marginal effects are evaluated at the mean.

However, the presence of dependents apparently does not influence the crucial decision of migration duration, a finding that has recently been confirmed by Pinger (2007). We regard this result as worrisome, since it implies that—due to permanent emigration—many children grow up without or with only one parent.²³

Some related findings concern the effects of individual migrant characteristics. The only significant result here is that the probability of having a seasonal migrant is higher if the migrant is male. The migrant’s age and education, and the fact whether he is married or not does not influence

Moldova. As an example, the most recent Poverty Reduction Report for Moldova states that child poverty among children growing up without parents is increasing—especially in regions with high rates of out-migration (IMF 2004). Likewise, a recent World Bank report on Migration in Eastern Europe suggests that the increasing number of street children in Moldova and lower enrolment rates can be associated to migration (Mansoor and Quillin 2007: 178).

²³ If the migrant is not one of the parents, this result is of course less surprising, but it is quite likely that the migrant is one of the parents in most cases.

the decision. We expected that at least marriage increases the likelihood of migrating seasonally, because of the psychological costs of separation (Mincer 1978). Again, this result could be worrisome because families are often living separated.

Another finding, which we consider as surprising, are the insignificant coefficients for the poverty perception variables. We expected to find a positive effect here because seasonal migration appeared to us as a natural coping strategy for the poor. The insignificant results suggest that—although migration appears to be phenomenon of poorer households—the perceived poverty situation does not affect the decision of which form of migration is chosen.

An interesting story evolves from the results for the human capital variables. An additional household member with university education significantly lowers the probability of having a seasonal migrant by up to 8 per cent. This suggests, that mainly low-skilled workers migrate seasonally. Contrarily, higher skilled workers are more likely to leave abroad permanently. The finding is in accordance with the qualitative research carried out in the Moldovan migration studies, indicating that most permanent migrants leave for European destinations, which are harder to reach due to increased costs and risks. Therefore, our results correspond to the common finding that migrants tend to positively self-select when migration costs are high, and conversely (Chiquiar and Hanson 2005).

Community networks—defined as the prevalence of migrant households in a community—do not appear to have any effect on the decision to migrate seasonally versus permanently. However, our variable for seasonal community networks—measuring the prevalence of seasonal migrants only—turns out to significantly increase the probability of seasonal migration (see specification 4). In other words, people drawing on a network that consists of seasonal migrants have a higher probability of migrating seasonally, while the overall network of migrants (including households with longer-term migrants) does not affect the seasonality decision.²⁴ Note that the reverse is true as well: the prevalence of seasonal migration in a community does not appear to directly encourage permanent migration; a finding that might be highly interesting to policymakers.

²⁴ One might suspect that the significance of seasonal networks is mainly driven by the fact that most seasonal migrants go to Russia (see above) so that we truly observe a “destination network” at work. We checked for this potential criticism by running the regressions for migrants to Russia only. The results were the same.

Instead, a variety of rather specific networks appear to be in place, which is in accordance with other studies (e.g. Davis et al. 2002; Bauer et al. 2007).

In specification 5, we include both overall prevalence of migrant households and specific prevalence of households with seasonal migrants. It turns out that overall, unspecific networks lower the probability of seasonal migration, while the effect of specific seasonal networks is strengthened in comparison to specification 4.

Existing family migration experience turns out to be significant and positively related to seasonal migration. Unfortunately, our data does not allow us to distinguish between seasonal and longer-term migration experience in the family, similar to what we did for community networks.

Last but not least, some interesting insights evolve from the effects of location variables on the decision to migrate seasonally. On the one hand, the coefficient for the rural dummy is weakly significant and positive. The estimated marginal effects tell that rural households have a 5.4 per cent higher probability to have a seasonal migrant than urban households. On the other hand, migrant household located in Chisinau are less likely to have a seasonal migrant: the probability is 13 per cent lower than for households located out of Chisinau.

5.3 Robustness Checks

Generally, the results presented above are very robust to variable selection and model extensions. As an example, we disentangled household size in number of adults as well as the number of female and male adults. It turned out, that the coefficients were not significantly affected.

As a more comprehensive exercise, we extended the number of community variables in order to control for regional income differences and local labour market conditions. For this purpose we extracted and pooled regional level data from the Moldovan Household Budget survey of 2004.²⁵ First, we re-ran our regressions including a variable of per capita *average income* and per capita *average expenditure* as well as *average salary*.²⁶ Additionally, we included the variable *agric* defined as the number of household heads in the region working in agriculture, and the variable *fixed*

²⁵ For this purpose we calculated regional averages from individual household-level data.

²⁶ Note that the number of observations drops considerably when we do these robustness checks because the community variables included stem from a different data set and are not available for all household observations.

capital investments in the region provided by the National Statistics Office Moldova. None of these changes altered our results in a severe way. Only the community network variable as well as the rural dummy were affected. Inclusion of *agric* shows that it takes over the role of the *rural* dummy from previous regressions. In particular, we find a negative coefficient of *agric* when *community network* is included, and a switch to a positive coefficient when *community network* is excluded. Again, this might indicate that networks and living in rural settings are substitutes for each other.

As mentioned in Section 4, we also estimate probit sample selection models in order to rule out biased results. For the sample selection model to be identified, it is necessary to include at least one significant explanatory variable in the selection equation (i.e. the general migration decision), which does *not* affect the outcome (i.e. the seasonal versus permanent decision). Due to a lack of alternatives, we chose to exclude the *poverty perception variables*, and, for robustness, also estimate the model excluding the variable *dependents* from the outcome equation.

In order to justify the exclusion of the *poverty perception variables* in the outcome equation, one might argue that poverty is a general determinant of migration, but does not affect the decision about the length of stay abroad. Our results in Section 5.2 show that they are indeed not found to be a significant determinant of the chosen type of migration. For accuracy, we also performed a likelihood ratio test, indicating that the variables jointly do not have any influence on outcome probability ($\chi^2 = 4.12, p = 0.13$). As to the variable *dependents*, one can put forth a similar argument since it appears to be insignificant for the seasonal versus longer-term decision. Nevertheless, we are aware that both options are not ideal. For instance, we argue above that we in fact did expect the presence of dependents to positively influence the decision to migrate seasonally instead of permanently.

The results of the probit sample selection models are presented in Table 6. For comparative purposes, the results of ordinary probit regressions are also provided.²⁷ The comparison shows that the coefficients of the sample selection models closely resemble those of the ordinary probit estimation. The Wald test of independent equations also indicates that our estimates are not biased due to sample selection. Thus, our results are very robust to the methodology used.

²⁷ In contrast to the logit models in the previous sections, we present the results of a probit estimation here, because this facilitates comparison with the results of the probit sample selection models.

Table 6: *Results of the Probit Models with Sample Selection*

	Specification 1			Specification 2		
	Probit	Probit with selection		Probit	Probit with selection	
		Outcome	Selection		Outcome	Selection
		$y = \text{seasonal}$	$z = \text{migrant}$		$y = \text{seasonal}$	$z = \text{migrant}$
Household size	0.09*	0.08	0.30***	0.10**	0.10*	0.30***
	(0.05)	(0.07)	(0.03)	(0.04)	(0.05)	(0.03)
Dependents	0.01	0.02	-0.22***	—	—	-0.22***
	(0.07)	(0.08)	(0.04)			(0.04)
Adults with secondary education	-0.07	-0.07	0.06*	-0.08*	-0.07	0.06*
	(0.05)	(0.05)	(0.03)	(0.04)	(0.05)	(0.03)
Adults with vocational education	-0.12**	-0.12**	0.10**	-0.13**	-0.12**	0.10**
	(0.06)	(0.06)	(0.04)	(0.05)	(0.06)	(0.04)
Adults with university education	-0.17***	-0.17***	0.10**	-0.19***	-0.18***	0.10**
	(0.06)	(0.06)	(0.04)	(0.06)	(0.07)	(0.04)
Age of household head	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
“European” citizenship	-0.11	-0.12	0.68**	-0.09	-0.06	0.68**
	(0.17)	(0.19)	(0.14)	(0.17)	(0.21)	(0.15)
Perceived poverty sit.: bad	—	—	1.53***	-0.03	0.03	1.53***
			(0.14)	(0.30)	(0.45)	(0.14)
Perceived poverty sit.: medium	—	—	1.55***	0.15	0.21	1.55***
			(0.14)	(0.30)	(0.45)	(0.14)
Family migration experience	0.41***	0.38*	1.29***	0.41***	0.45*	1.29***
	(0.09)	(0.20)	(0.07)	(0.09)	(0.25)	(0.07)
Community networks	-0.03***	-0.03***	0.03***	-0.03***	-0.03***	0.03***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)
Community networks, seasonal migr.	0.07***	0.07***	-0.01*	0.07***	0.07***	-0.01*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)
Rural household	0.15	0.14	-0.05	0.14	0.14	-0.05
	(0.10)	(0.10)	(0.06)	(0.10)	(0.10)	(0.06)
Constant	-0.01	0.08	-3.64***	-0.05	-0.23	-3.64***
	(0.24)	(0.54)	(0.20)	(0.37)	(1.09)	(0.20)
Wald test of independent equ. Chi2		0.04			0.03	
Wald test of independent equ. p-value		0.85			0.87	
Observations	999	3,665	3,665	999	3,665	3,665

*, **, *** indicate significance at the 10, 5 and 1 per cent level respectively. Robust standard errors in parentheses. Note: Individual migrant characteristics are not included in these robustness checks because data is not available for non-migrant households in the selection equation.

6 Conclusions

This paper sheds some light on the phenomenon of mass emigration in Moldova; in particular on the factors that induce a household to send a migrant abroad, and on the factors that influence the choice for seasonal versus permanent migration. A unique data set allows us to explore these issues on a micro data level.

Taken together, our estimations explain seasonal migration less well than we expected initially. Yet, we could gain some important insights about factors that do *not* seem to determine the decision to migrate seasonally. Most notably, the choice of whether to migrate seasonally or for longer periods of time does not appear to be influenced by family characteristics such as marital status and number of children. Apparently, migrating family members who are married and partly responsible for children are not able or not willing to choose for shorter stays abroad. This finding strengthens existing worries on high familial and emotional costs of migration and even child neglect—issues that are regularly raised in policy reports on Moldova and other Eastern European emigration countries (see e.g. IMF (2004) and Mansoor and Quillin (2007)). However, altogether, migration is confirmed to be an important coping strategy for the poor and may thus contribute to considerably improved standards of living in impoverished areas.

From a policy perspective, our findings on networks might be of high relevance. First, it seems that for urban households (as compared to rural ones) the size of the network is a more important determinant of migration. Second, we identify a positive link between specific seasonal networks and the choice of migrating seasonally. Interestingly, the link to seasonal migration does not hold for general community networks, which include permanent migrants. In other words, we find some indication that seasonal migration is *not* positively related to longer-term migration.

We believe that Moldova's traumatic mass emigration merits further research—not only for policymakers in the country itself but also as an exiting and relevant case study. In particular, it would be interesting to quantify the effects of migration on the situation of households left behind. Likewise, it might be rewarding to investigate the link between seasonal and permanent migration further.

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